One Last Effort to Save the Po‘ouli

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America's Most Endangered Birds

Though the odds may not be good, we still have a chance to save the Po‘ouli from extinction. We must try.

The upper rainforests of East Maui are home to several of America's most endangered birds. All are forest birds. All are found only in Hawai‘i. And all are declining despite the progress made in saving their rainforest habitat.

The most endangered of the group is the Po‘ouli (*Melamprosops phaeosoma*). Little is known about this small songbird because scientists discovered it only 30 years ago.

In 1981, the Po‘ouli numbered perhaps 150 birds. Today, we know of only 3 birds in existence.

Two other East Maui forest birds, the Nukupu‘u (*Hemignathus lucidus affinus*) and Maui ‘Akepa (*Loxops coccineus ochraceus*) are so rare and without breeding pairs, they are considered functionally extinct.

Like other native species in Hawai‘i, native birds have been declining in the face of onslaughts from alien species. Habitat degradation by feral pigs; predation by rats, cats, and mongooses; avian disease spread by mosquitoes; competition with introduced birds; and lack of adequate food resources have all contributed to the decline.

Efforts undertaken since 1999 to improve forest bird habitat in the Hanawi Natural Area Reserve have benefitted many of Maui's forest birds, including the endangered Maui Parrotbill (*Pseudonestor xanthophrys*) and the ‘Akohekohe (*Palmeria dolei*), as well as other rainforest species.

A translocation project in 2002, during which a female Po‘ouli was captured and moved from her home range into that of the male Po‘ouli, brought a wealth of new biological information about the species. Based on the scientific knowledge now available, biologists are preparing for a new endeavor – what's being termed as the "last ditch effort" – to save the species from extinction.

Finding the Po‘ouli

“Po‘ouli” means “black head” in Hawaiian, a name bestowed to a small, stocky brown forest bird with a bandit’s black mask by Mary Kawena Puku‘i, a renowned authority on Hawaiian culture. The bird weighs less than an ounce and measures about 5.5 inches in length.

Discovery of the Po‘ouli in 1973 was astonishing news. How could a new bird possibly turn up on an island inhabited by 40,000 people and explored for birds for more than a century?

Trying to enter into the woods on Haleakala’s rugged, steep slope quickly provides many answers. Tangled, moss-covered, dripping vegetation – 100,000 acres of it – blocks movement in every direction. Then there is the terrain, a seemingless endless obstacle course of rivers and ravines. Together, vegetation, inclement weather, and terrain discouraged exploration of this area until recent times.

These challenges didn’t discourage a crew of college students from the University of Hawai‘i. In the summer of 1973, they organized and carried out a biological expedition directly into the heart of Haleakala’s wet forest. What they found was one of the most pristine Hawaiian rainforests – and the Po‘ouli.

Did You Know?

- Fossil evidence indicates that the Po‘ouli once inhabited the southwestern slope of Haleakala Volcano at 1,000-4,800 feet elevation in much drier habitat.
- In its restricted historic range, the population was initially estimated to be fewer than 200 birds.
- Because the Po‘ouli has always been rare and cryptic, attempts to calculate reliable estimates of population size have never been possible.
- Sightings of the Po‘ouli have declined steadily since 1976. All historic detections of Po‘ouli have been within the Hanawi Natural Area Reserve, Hana Forest Reserve, and Haleakala National Park.
- The Po‘ouli has carved out an eating niche as a forager of bark, moss, and lichens, which they rip apart in search of an unusual prey – native tree snails. Few birds eat snails, and the Po‘ouli is the only Hawaiian forest bird known to consume them. The bird also eats insects, spiders, and fruit.

How Many are Left?

In 1996, only four Po‘ouli could be found with any regularity. Two other birds were detected very infrequently.

In 1997, the existence of only three birds could be confirmed. The extremely low densities and quiet nature of the Po‘ouli, plus the harsh environment in which they live, make individual birds extremely difficult to detect. But now, after 5 more years of searching, these birds are believed to be the last of the species.

The last known breeding of Po‘ouli occurred in 1994 and 1995 when a fledgling was found attended by a male and female, and in 1996, when an immature bird was spotted with a male. These sightings of young birds, which occurred in the same general area, suggest that they may have been raised by the same pair.

The three remaining individuals, a male and two females, live in separate home ranges from less than one-third to slightly more than one mile apart. The home ranges are approximately 8, 25, and 28 acres in size.

All three were banded 6 years ago and were already adults at that time. We know little about how long these birds may live.

The "Last Ditch Effort"

On February 3, biologists will fly into the remote Hanawi Natural Area Reserve by helicopter, ready to begin the "last ditch effort" to save the Po'ouli. For up to two months, teams of 6-8 people will attempt to capture the remaining three Po'ouli known to exist and bring them into captivity, with the hope that a breeding pair can be formed.

Much of the information gained during the 2002 translocation effort will be put to use. Mist nets – fine-mesh nets that are almost invisible, especially in a rainforest – will be set up in the known territories of the birds to capture them one at a time.

The same padded box used to successfully transport the female in 2002 will be used again. The female readily dined on waxworms and native land snails – though she rejected mealworms – and these foods will be offered again. Two highly qualified and experienced avian veterinarians will take turns accompanying the expeditions to gauge the birds' health and stress levels.

After allowing the captured bird a brief rest in the padded box, it will be flown by helicopter to its new home at the Maui Bird Conservation Center (MBCC) in Olinda. While the field crew continues its efforts to capture the remaining Po'ouli, the staff at MBCC will launch what avian conservation coordinator Alan Lieberman calls "the ultimate avicultural challenge," to maintain and breed what are likely the last remaining birds of this unique and secretive species.

A Chronicle of the Po‘ouli

Although the modern history of the Po‘ouli only spans 30 years, this small bird with the “Lone Ranger” mask has touched the lives of many people. Their interactions bring us our only knowledge of the bird . . . and our conviction to continue the battle to recover the species.

Ancient Hawai`i

What is now known about the depth of understanding ancient Polynesians had of natural history is consistent with the idea that Hawaiians studied and knew much about forest birds and their behavior, and had names for them all.

1880s

By the 1880s, when English and American naturalists first began exploring Maui in earnest, the birds had for the most part died out from mosquito-borne avian diseases and predation below about 4,000 feet elevation.

Hawaiian lore about the birds vanished with them. Fortunately, some names – like ‘Akohekohe – survived.

These Western naturalists were involved in a heated race to find and describe new species of birds, and to do this they mainly collected (shot and stuffed) specimens.

They wrote down Hawaiian names spoken by their assistants. These assistants never mentioned the Po‘ouli. Nor did the naturalists find Po‘ouli on their own.

Like modern bird watchers, they flocked in turn to the only point of access at the forest edge around what is now called Olinda and Ukulele Camp.

Apparently, the Po‘ouli had already disappeared from the neighborhood. Had these naturalists ventured across Haleakala Crater and over the north rim, who knows what besides the Po‘ouli they would have found.

1973

Ninety years later, when University of Hawaii students from the Hana Rain Forest Project (sponsored by the National Science Foundation) entered the rainforest wilderness on the northeastern slope, they stepped into a remote world known to virtually no one. The ecosystem was virtually intact with minimal scarring from only a few pigs.

The expedition established a base camp at Frisbee Meadow. This grassy flat area above the forest offers views of the north slope of Haleakala from Pa`ia to Hana.

Then a student, Betsy Harrison Gagne returned from a recognizance of the unexplored forest located below the camp and reported having seen three unrecognizable small birds with black faces, that were colored like a chickadee.

Jim Jacobi, team biologist, and Tonnie Casey, another student at the time and who was responsible for bird surveys during the project, hiked down to find the bird. Jacobi was lucky enough to see and sketch a Po‘ouli that approached him through the screen of vegetation in a moment of mutual discovery.

Later Casey and others searched for and found the “mystery bird.” The news spread from there.

1974

Two specimens were collected, as is customary, for formal description. One stuffed specimen is now at Bishop Museum, the other at the American Museum of Natural History in New York City.

The scientific description was written by Casey and Jacobi and published by Bishop Museum. Mary Kawena Puku‘i gave the bird its Hawaiian name, Po‘ouli, meaning “black-head.” The scientific name, in Latin, was given later to match the Hawaiian description.

Occasionally, students and biologists would undertake the 12-mile hike in and out of the crater to reach Frisbee Meadow.

1980

A multi-agency Hawai‘i Forest Bird Survey began with a modest budget for helicopter travel to and from camp sites. The study conducted counts of all species of birds in Maui forests. It was the first formal survey of the Po‘ouli.

Because the rigid methodology involved counting birds along transects miles apart, the technique was too coarse to pick up many Po‘ouli. In fact, the counters only detected 3 individual Po‘ouli during counts – not enough to estimate the population size with confidence. However, with so many people in the right areas before and after counts, more birds were seen and data taken.

1985

A hiatus followed until 1985, when the U.S. Fish and Wildlife Service (USFWS) began a project, led by Cameron Kepler, to study the population ecology of forest birds below Frisbee Meadow.

Researchers would visit the site quarterly for a week or two to study bird behavior, conduct counts, record bloom and fruit production of trees, measure pig damage, and sample rats.

The group encountered Po‘ouli incidentally, through the bird was conspicuously rarer by now.

1986

In search of greener pastures, one adventurous party of three crossed the formidable Hanawi Gulch to the east and within a few hours came upon a Po‘ouli pair busily at work constructing their nest in the leafy boughs of an ‘ohia tree.

Carried away by their interest and excitement, the small team of three chose to spend the night nestled beneath the leaning trunk of a forest giant, 100 feet along the ridge above the nest, clinging to each other for warmth in the near-freezing dampness.

Within two days, everyone left the field to organize a study of this first Po‘ouli nest.

Kepler recruited more observers and met to outline research questions, observational procedures, and a schedule, assigning observers in pairs to relayed stints of 5-7 days.

The only safe camp site was a tight shelf half an hour up slope from the nest. To reach the nest each day, observers slipped and climbed their way down the 700 feet elevation of ridge crest tangled with moss-laden shrubs and trees. After an 8-9 hour vigil at the nest, they retraced their steps at the end of the day.

Rain fell almost daily, the tent leaked and nothing dried out, but the Po‘ouli nest proceeded on schedule until finally a deluge of 13 inches of rain caused the nest to fail. Days before, the observers had given up trying to watch the nest through a curtain of rain, and instead retreated to their tent. That proved too much, so they abandoned the field.

Upon returning in better weather, the observers found the nest empty and unattended. The parents soon rebuilt nearby and successfully fledged a chick. The Questar telescope used to watch the second nest provided clear and close up views of parental behavior. Funds for the project dried up soon after.

Though field work had ceased, the individuals and agencies involved in the project had seen enough of the Po‘ouli and its habitat to become worried. Pigs were uprooting or eating much of the understory vegetation, leading to eroded soil and muddy streams. In places, nothing but tree roots remained grasping exposed bedrock.

Over the next several years, the State of Hawai‘i established the Hanawi Natural Area Reserve of 7,500 acres and drew up a management plan outlining the building of fences around four units.

Fence building was accomplished by state employees, led by Randy Solomon, whose work habits have since become legendary. The fences were incredibly difficult to install, particularly the contour fences that ran up and down a seemingly endless series of ridges and gulches.

1992

With newly found funds, the Hawai‘i Department of Land and Natural Resources (DLNR) resumed the multi-agency Hawai‘i Forest Bird Survey on Maui to duplicate, as closely as possible, the surveys that were conducted in 1980 and count all species of birds in the East Maui forests.

Many of the same transects that were originally counted were repeated, but no Po‘ouli were detected during these surveys. Because of the rigid methodology involved and the limitations of time and manpower, this survey technique may miss extremely rare and secretive species such as the Po‘ouli. The lack of detections spurred concern and the decision to follow up on the status of the species.

1994

Studies of Po‘ouli resumed in 1994 following sightings by Betsy Gagne and Thane Pratt, a biologist with the Biological Resources Division (BRD) of USGS. Searches to the east of Frisbee Meadow located two parents with a fledgling and a few sightings of other birds.

Tonnie Casey initiated a project to decrease rat numbers in the area by means of a warfarin-like bait, diphacinone. The bait is applied in bait stations according to government specifications to ensure that only rats eat the bait. Because the Po‘ouli were not consistently found at this site, baiting was discontinued.

1995

At the recommendation of the USFWS’ Hawai‘i Forest Bird Recovery Team, a new project – called the Maui Forest Bird Project – dedicated to saving the Po‘ouli and other unique forest birds was cofunded by the State and USFWS and initiated by BRD.

A sturdily constructed cabin was built to serve as base camp for the field team of 6-8 people, and provide shelter from dangerous winter weather that sweeps over the mountain top.

1996

The researchers thoroughly searched the entire historical geographic range of the Po‘ouli at least twice. Birds turned up at four locations. Six individuals were estimated to have been seen.

Fearing that the birds might be falling prey to rats, mongooses, or feral cats, the team began to control predators. In the fall, two 100-acre areas with two birds each were protected by a network of bait

stations to poison rats, and with snap and Fenn traps to kill rats and mongooses. The field crew also set live traps to remove cats.

After several weeks of recording gnawed baits, the crews reported that bait consumption had dropped off. Snap traps yielded few rats, confirming that the control program was working. The program to remove predators still is ongoing as part of an effort to benefit all forest bird species in Hanawi Natural Area Reserve.

Pig-free fence construction was completed with 2,000 acres now protected. Recovery of the native vegetation proceeded rapidly.

1997

Despite intensive searches, only three Po‘ouli – and no nesting pairs – were sighted. One of the Po‘ouli was captured in January and fitted with leg bands that it wears like small colored bracelets. Easily recognized by its unique combination of colored leg bands, the bird has been seen many times since. Unable to find other Po‘ouli, the bird frequently is in the company of a Maui Parrotbill family.

1998

The primary effort of the year was to capture all three Po‘ouli and determine their sex. With the help of scientists at University Diagnostics Limited in England and the National Zoo genetics lab in Washington, D.C., DNA was extracted from the birds’ feathers and analyzed. These tests determined that two of the Po‘ouli were females and one male.

Despite continuing efforts to find more Po‘ouli in their historic habitat, no additional birds were sighted.

In September, DLNR and USFWS released an environmental assessment outlining six alternative actions that could be undertaken to attempt to prevent the Po‘ouli’s extinction. Ranging from taking no additional action to bringing all the birds into a captive breeding program, the alternatives were discussed at three public meetings on Maui and O‘ahu.

More than 50 individuals shared their views with the agencies, including scientists, members of conservation organizations, and concerned citizens. After considering their input, the agencies opted to combine two of the alternatives into a proposed action plan involving expanded habitat management activities, surveys for additional birds, and translocation of individual birds to attempt to form a breeding pair.

1999-2001

The Maui Forest Bird Project was charged with implementing the action plan. Studies of the birds' food resources, avian disease, predation, and competition from invasive alien species kept the team busy, along with extensive efforts to improve the habitat for native species.

2002

After three years of improving forest bird habitat and unsuccessfully searching for additional Po‘ouli, biologists began the third phase of the action plan: playing Cupid. Their plan was to capture a male and female Po‘ouli in a short period of time – no small task – and then introduce them to each other.

Beginning January 7, it took the scientists 42 days of hanging mist nets – special fine-mesh nets that are almost invisible – and trudging through miles of rugged rainforest terrain to finally capture one of the females. The scientists were forced to give up on catching the male, who eluded their month-long attempt to land him in a mist net.

Once they landed the female on April 4, the scientists kept her for a few hours in a holding box developed for the project by Peter Luscomb, general curator of the Honolulu Zoo. The soft enclosure was designed to protect the Po‘ouli from hurting herself if she became nervous and flew wildly against the sides. An avian veterinarian accompanied the scientists just in case the small bird was injured. To the joy of the researchers, the Po‘ouli remained calm and settled down to a meal of wax worms and snails, indicating that the very rare bird may adjust to captivity. That knowledge is a boon to the efforts to save the Po‘ouli from extinction.

While the Po‘ouli was in the padded box, she was fitted with a tiny transmitter weighing just 0.7 grams so her movements could be tracked. It had enough battery power for a month.

The researchers then hiked the female Po‘ouli into a site in the male's home range and set her free just before dark, in the hope that in the morning, she and the male would meet. The researchers were up before dawn with radio telemetry equipment to track the female's every move. For the first few hours, she flew around in the male's range but by midday, she headed home. As far as the scientists know, the two birds didn't meet.

The research team tracked the female Po‘ouli's movements for another 10 days until the radio fell off. During that time, scientists were able to unravel some of the mysteries surrounding the Po‘ouli's behavior for the first time since the species was discovered.

With the mating season passed, the scientists agreed not to try to capture and relocate the other female, but rather to begin looking at further options in the struggle to save the Po‘ouli from extinction.

In November, after considering the possibilities remaining, DLNR and the USFWS agreed that bringing the last three Po‘ouli into a captive setting would offer the best hope for the species’ survival. Although a variety of options were considered, including whether to bring the birds into a field aviary or a captive propagation center, the biologists believe that the Maui Bird Conservation Center offers the most stable environment for the birds, where environmental factors such as weather can be controlled and veterinary care is more readily available.

2003

After months of planning, the next chapter of the Po‘ouli’s chronicle is about to begin. Up to six 8-day trips into Hanawi Natural Area Reserve have been scheduled, with the first beginning on February 3.

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